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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,062	12/02/2003	John G. DeSteese	23-69853-01	4870

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EXAMINER	
BARTON, JEFFREY THOMAS	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
12/31/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,062	DESTEESE ET AL.	
	Examiner	Art Unit	
	Jeffrey T. Barton	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-7 and 32-52* is/are pending in the application.

4a) Of the above claim(s) *39-50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-7,32-38,51 and 52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20080916*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 16 October 2008 has been entered.

Status of Objections and Rejections Pending Since the Office Action of 16 June 2008

2. The objection to the specification is withdrawn due to Applicant's amendment and showing where support for the amendment is to be found in Application No. 10/724,744.

3. All rejections of claim 31 are obviated by cancellation of the claim.

4. The rejection of claims 1, 5-7, and 31-38 under 35 U.S.C. §112, first paragraph is withdrawn due to Applicant's showing where support for the limitations is to be found in Application No. 10/726,744.

5. All other previous rejections are maintained.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 5-7, 32-34, 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Migowski (WO 89/07836; citations below are to the English translation provided on the IDS of 13 November 2007) in view of Bass et al. (US 6,207,887)

Regarding claims 1, 51, and 52, Migowski discloses a method for providing power, comprising: providing a thermoelectric generator having a first end and a

second end (Figures 2 and 4); exposing the first and second ends to two different temperature regions (Paragraph bridging pages 2 and 3, Paragraph bridging pages 4 and 5); utilizing a difference between the temperature regions to produce electric power; wherein the thermoelectric generator comprises a plurality of thermocouples comprising p-type and n-type thin film semiconductor thermoelements formed on a single flexible substrate. (Paragraph bridging pages 2 and 3 through the third full paragraph of page 3) Migowski discloses sputter deposition of the thermoelements. (1st full paragraph on page 3)

Regarding claims 5-7, Migowski teaches forming the p- and n-type thermocouples from Bi, Te, Sb, Se, or Pb. (3rd full paragraph of page 3) As bismuth telluride and other claimed compounds are conventional thermoelectric materials, selection of these known materials based on this listing would have been obvious to one having ordinary skill in the art.

Regarding claims 32 and 33, Migowski teaches preparing the generator on a single continuous flexible substrate and winding the substrate in a coil. (Paragraph bridging pages 2 and 3 and the 1st full paragraph of page 3)

Migowski does not explicitly disclose a device with pluralities of thermoelements connected in series and parallel precisely as claimed.

Bass et al disclose a series-parallel connection scheme for a thermoelectric generator (Figure 13A; Column 6, lines 46-62) in which plural n-type elements are connected electrically in parallel and are connected in series to a plurality of p-type

elements that are connected to each other in parallel. Four thermoelements are present in each resulting couple.

It would have been obvious to one having ordinary skill in the art to modify the method of Migowski by employing the series-parallel connection scheme of Bass et al, because Bass et al teach that such connection protects against complete power loss in the event of damage to a single thermoelement, thus providing increased reliability. (Column 6, lines 46-62)

Regarding the limitation to power being generated "regardless of whether the first temperature region is warmer or cooler than the second temperature region", the Examiner's position is that any thermopile having hot and cold junctions will provide power regardless of which junction side has the higher temperature. Reversing the hot and cold sides results in reversal of the polarity of the output power, but power is generated in either case.

Regarding claim 33, as a spindle is a conventional means of aiding in coiling an elongated material, it would have been obvious to one having ordinary skill in the art to provide the coiled generator of Migowski by winding it around a spindle, with the predictable result of production of the desired coiled generator. As a skilled artisan would have recognized that the semiconductor materials of the device are not ideally flexible, such a spindle would have also provided the expected advantage of preventing coiling the device with too small a diameter, thus preventing damage to the device.

Regarding claims 34 and 51, selection of element dimensions is considered to be a matter of design choice, depending upon the dimensions and gradient present in the

installation site, substrate dimensions, desired number of junctions, desired voltage, among other considerations. In the absence of evidence of criticality, selection of length to area ratios as claimed is considered obvious to one having ordinary skill in the art. Also note that in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

10. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Migowski and Bass et al as applied to claims 1, 5-7, and 31-34 above, and further in view of Simeray et al. (US 6,340,787)

Migowski in view of Bass et al is relied upon for the reasons given above. Migowski et al suggest use of their thermoelectric generator for general "power supply units, etc." (Page 3, 6th full paragraph)

Neither Migowski nor Bass et al explicitly teaches the particular first and second temperature regions instantly claimed.

Simeray et al teach low-power thermoelectric generation using small temperature gradients, as used by Migowski et al, specifically teaching that the first and second temperature regions can be the ground and the air above the ground (Figure 6; Column

6, lines 17-30) or air inside a building and air outside a building. (Figure 5, Column 6, lines 10-16)

Relevant to claim 36, in the ground/air embodiment, Simeray et al disclose a heat pipe (74) connected to the first end and buried in the ground. (Figure 6) Relevant to claim 37, Simeray et al disclose a second heat pipe (73) coupled to the second end. Such a "heat exchanger" and "thermal collection stake" read on the instant heat pipes, as they conduct heat to the respective hot and cold junctions.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Migowski by employing the generators in locations such as between the ground and air, or in a wall of a building, as taught by Simeray, because Simeray teaches that such locations provide suitable temperature gradients for low power thermoelectric generators and Migowski suggests that his generators may be used generally in power supply units. Such a combination will provide the predictable result of successfully generating power.

Specific to claim 38, building interiors conventionally have HVAC systems having ducts. Therefore, the interior of the building comprises air inside ducts, while the exterior of the building comprises air outside of such ducts. The combination thus meets the limitations of the claim.

Response to Arguments

11. Applicant's arguments filed 16 October 2008 have been fully considered but they are not persuasive.

Applicant argues that no one having ordinary skill in the art would have combined Migowski and Bass, since Migowski uses thin film thermocouples, as opposed to the three dimensional block of Bass. This is not persuasive, because Bass teaches that provision of multiple parallel-connected n-type elements connected in series to multiple parallel-connected p-type elements protects against complete power loss in the event of damage to a single thermoelement, a benefit that one having ordinary skill in the art would have clearly seen as desirable in a device such as that of Migowski. The rejection is therefore proper and is maintained.

Applicant's arguments that none of the prior art of record teaches the instant length to area ratio are well taken, but no evidence of criticality of the claimed dimensions has been provided, and the rejection is therefore maintained. Applicant's remarks asserting the importance of the dimensions cannot take the place of evidence on the record. Note *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Applicant is invited to provide evidence of criticality of the dimensions. As noted above, in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. There is no evidence that any significant difference in performance would result from the selection of the claimed dimensions.

Applicant's assertion of error in the rejection relying upon Simeray is not persuasive - if applicant wishes to be limited to a particular type of heat pipe distinct from that taught by Simeray, applicant should recite limitations that are distinct from the prior art. It appears that Applicant misunderstands the breadth of the claim language. The examiner maintains that structure 74 is a "heat pipe", broadly recited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571)272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey T. Barton/
Art Unit 1795
29 December 2008